Mercotronic Original Schematic Drawing Coil Test Mode Information

Note: This information is provided as is – Use At Your Own Risk And Expense

Components in play

B1 – 7.5 volt battery

C1 – Capacitor to reduce arcing at contact set and prolong ignition coil under test oscillations

CS1 – Contact set to make and break circuit that provides current to red test clip TL1

L1 – Lamp to indicate S1 is in on position and motor should be running

M1 – Meter to display amount of current flowing to ignition coil under test

Motor – operates cam to open and close contact set CS1

R7 – High wattage Resistor to act as shunt for meter M1

S1 – 5 Position Switch with 4 segments

Spark Window –Displays spark across electrodes

TL1 – Red test clip connects to ignition coil primary of coil under test

TL2 – Black test clip connects to ground terminal of coil under test

TL3 – Large red test clip connects to secondary terminal or plug wire of ignition coil under test

VR1 – Variable resistor to control amount of current supplied to ignition coil under test

In the ignition coil test mode the mulit-position selector switch S 1 is set to position 1. This supplies battery power from the positive terminal of the battery B1 to the DC motor which starts to turn operating a cam that opens and closes the point set CS1. The indicator lamp L1 will be illuminated. Current will also flow from the battery positive terminal to one side of resistor R7 and the positive terminal of the meter M1. Current flows through resistor R7 to the contact set CS1, the negative terminal of the meter M1 and to the one side of the capacitor C1. Current will flow through the variable resistor VR1 to the red test lead clip TL1 which is connected to the positive terminal of the ignition coil under test. Current will flow through the coil primary winding to the black test lead clip TL2 which completes the circuit to the battery B1 negative post.

As the motor rotates the contact set CS1 will continuously open and close the circuit going to the coil under test acting like an off on switch. With the contact set closed the primary winding of the ignition coil will become electrified and when the contact set opens the majority of the trapped electrical energy in the primary coil winding will be transferred to the secondary winding of the coil under test resulting in a spark being produced across the electrodes in the spark window if the current being supplied to the primary winding of the coil under test is high enough.

As the variable resistor VR1 is rotated the resistance value of VR1 will decrease resulting in more current to flow through R7 and the meter coil M1 – these two components may be viewed as two resistors connected in parallel. Resistor R7 is acting as a shunt resistor in parallel with the meter coil winding. Since resistor R7 is a fixed value it will only allow a fixed amount of current to flow through it to the primary winding of the ignition coil under test in a given time interval. The rest of the current flow will happen across the coil winding of the meter M1 and as the value of VR1 decreases the amount of current flowing through the meter coil will increase in proportion. This will result in the needle

movement of the meter increasing or decreasing depending on the resistance value of the variable resistor VR1.

In the Mercotronic model 98 and 9800 the value of the variable resistor is approximately 10 ohms so I would guess that the value of VR1 is probably similar but this is only a guess. The value of R7 is not given and because the meter circuit is set up differently in the model 98 and 9800 I do not know what the value of R7 should be in the original schematic. If your unit looks similar to the schematic connection wise you should be able to find a resistor equivalent to R7 as one end of it will probably be connected to the contact set CS1, a capacitor C1 and a switch terminal corresponding to S1B terminal 1 . My guess is the capacitor C1 is probably a value of 0.15 uF and rated for 400 volts DC. The resistor may be mounted on the multi position switch on a couple of terminals S1B terminal 1 and S1C terminal 1 and the other end of it will probably connect to the positive terminal of the meter M1 and to the positive terminal of the battery B1 when the switch is set to position 1. The resistor should have four or five colour bands around it – three should indicate the value and the fourth and possibly fifth should indicate the tolerance. This resistor may be out of spec and resulting in the meter reading being off.

With the battery disconnected and the switch set to the coil position test you can check the highlighted sections of the schematic to verify that there is no resistance between any two connection points. In a perfect world the reading should be zero but any reading of 0.2 ohms or less should be acceptable. If you have more resistance than 0.2 ohms then there is probably a connection problem between those two points. For example if you connected one ohmmeter lead to S1B terminal 1 and the other to the negative terminal of the meter you should get a reading of 0.2 ohm or less. You can check all contact points in a highlighted colour section of the schematic to verify that the resistance between them is acceptable. For example if you connect one lead of an ohmmeter to the red test clip TL1 and then touch the other lead of the ohmmeter to any spot in the blue highlighted section of the schematic (S1A bottom terminal, S1A terminal 1 and the one terminal at VR1 you should get a reading of 0.2 ohms or less. A higher resistance reading indicates a connection problem. Similarly the orange, green, red and black sections of the schematic can be checked for resistance problems.

Original Mercotronic Schematic From Patent Information
Ignition Coil Test Mode Witrch Position 1